

GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF MARCH 2, 1991

1. Western North America:

WETTEST WEEK IN 5 YEARS FOR CALIFORNIA.

More than 50 mm of rain soaked most of the western half and higher elevations of California as well as central Arizona and portions of north-central and south-central Utah. Very heavy totals of 200-330 mm were reported across the southern California coastal mountain ranges, Sierra Nevadas, and central Arizona. Elsewhere, generally 25-50 mm fell on other non-desert locations across California and Arizona as well as through most of Utah while 10-25 mm dampened Idaho. The heavy precipitation, while somewhat beneficial, had a limited impact on the region's large shorter-term moisture deficits, and had no substantial effect on water shortages generated by five years of drought in California (see front cover) [9 weeks].

2. Southeastern United States:

MORE HEAVY RAINS IN DEEP SOUTH.

Most locations from Louisiana eastward to the Georgia coast recorded 40-150 mm of rain, with amounts of 160-235 mm drenching portions of the Florida Panhandle, southeastern and southwestern Alabama, and southern Georgia (see Figure 1 and the United States Weekly Climate Summary) [14 weeks].

3. Europe

LIGHT PRECIPITATION DAMPENS WESTERN AND NORTHERN SECTIONS.

Precipitation totals of 10-40 mm moistened most of Spain, east-central and southeastern France, the British Isles, southern and western portions of the Benelux nations, and a few isolated locations across northern Poland, southern Scandinavia, coastal Yugoslavia, northwestern Italy, Corsica and Sardinia. Isolated locations across coastal Yugoslavia, northwestern Italy, and central Sardinia recorded 45-75 mm; however, less than 10 mm were measured at most stations across the continent as abnormally dry weather persisted [11 weeks].

4. Central and Western Sahel:

ANOTHER WARM SPELL DEVELOPS.

During the past 5 weeks, anomalously high temperatures (weekly

departures of +2°C to +4°C) have re-developed after the prolonged hot spell observed during the summer of 1990 abated during winter [5 weeks].

5. Southern Africa:

DRIER CONDITIONS ENVELOP SOUTHERN AREAS.

Fewer than 15 mm of rain were measured across South Africa, Botswana, eastern Namibia, and the southern three-quarters of Zimbabwe, bringing an end to significant moisture surpluses. Zambia, northern Zimbabwe, Malawi, and extreme western Mozambique, however, remained damp as 25-75 mm of rain fell. Slightly higher totals (75-100 mm) were recorded across northeastern Zambia and the southern half of Malawi [Ending after 9 weeks].

6. The Philippines

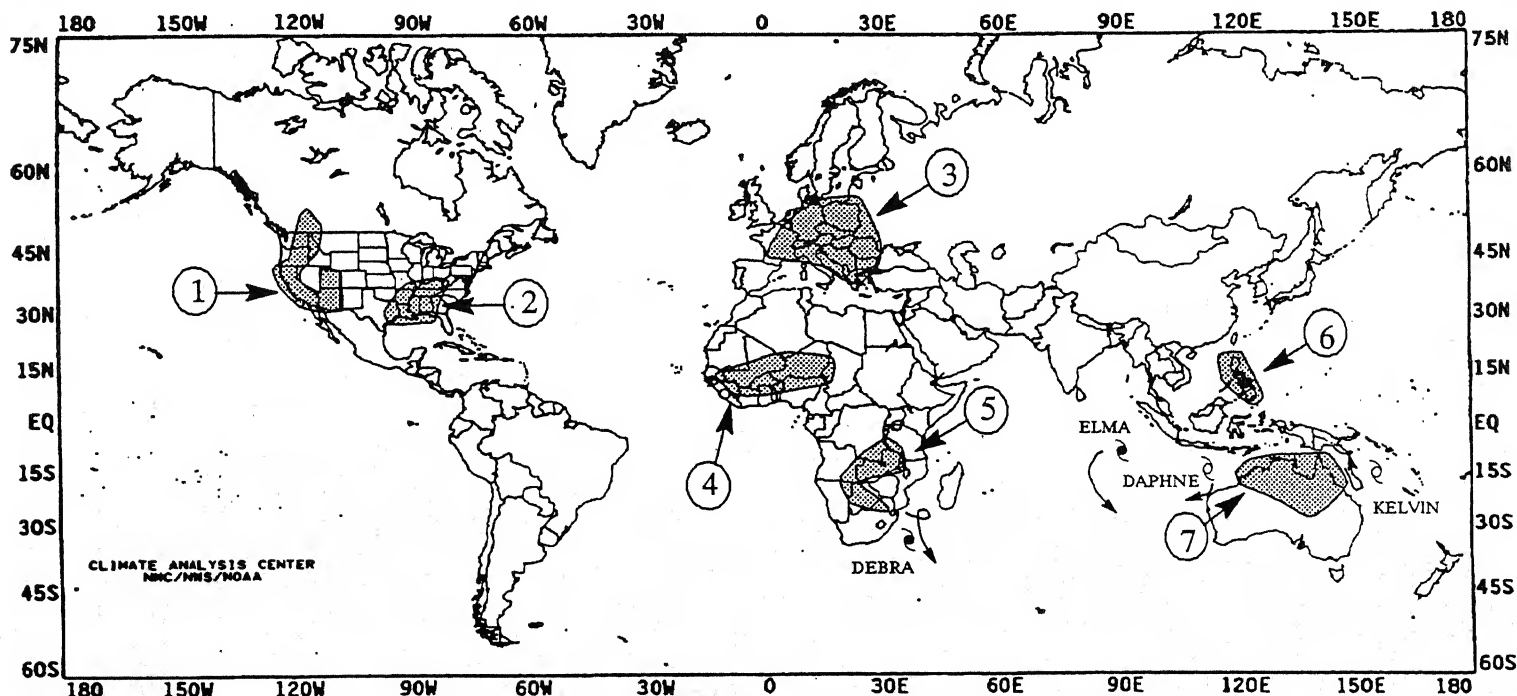
SLIGHTLY LARGER RAINFALL TOTALS OBSERVED.

Light rain (10-30 mm) dampened southeastern China, ending the short-lived dry spell in that region [Ended after 7 weeks]. Farther south, however, a second consecutive dry winter drew to a close across the Philippines as somewhat larger weekly totals were measured. Moderate rains (20-55 mm) dampened most locations from southeastern Luzon southward into northeastern Mindanao, with totals of 55-225 mm soaking much of Samar. Unfortunately, the increased amounts had little effect on moisture deficits, which approached 450 mm for the winter months at some locations [13 weeks].

7. Northeastern Australia:

A DRY WEEK FINALLY OBSERVED IN CENTRAL AND EASTERN QUEENSLAND.

Less than 15 mm of rain fell across most of the northern tier of the continent, with relatively large amounts (40-100 mm) restricted to the northern and eastern Cape York Peninsula, small portions of the east-central Queensland coast, extreme northern Arnhem Land, and portions of northwestern Australia, the latter region receiving some moisture from the fringes of Tropical Storm Daphne. Large rainfall surpluses persist across the region, however, and a few more weeks of drier weather will be needed to eliminate the large departures affecting some locations [10 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation and temperature data are this week's values, unless otherwise indicated.
MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF FEBRUARY 24 – MARCH 2, 1991

Some of the heaviest rains since mid-1985 soaked drought-stricken southern California, reducing the immediate danger of wildfires and providing some short-term relief from the drought. Over 4 inches of rain drenched the parched Los Angeles Basin (see front cover) while more than 2 feet of snow buried parts of the Sierra Nevadas. The welcome precipitation, however, did little to fill reservoirs, which remained at 15% of capacity in most of the state, and mandatory water conservation measures will continue, according to press reports, as California endures its fifth consecutive year of drought. The storms also spread heavy precipitation across the Southwest and Rockies as up to 22 inches of snow blanketed portions of Colorado and Utah. At week's end, intense thunderstorms spawned tornadoes and caused widespread flooding and power outages from eastern Texas into Alabama and northern Florida. At the same time, blustery north winds ushered Arctic air into the central states while strong southerly gales swept record warmth into the Atlantic Seaboard. Wind gusts reached 58 mph in Boston, MA.

During the first half of the week, a cold front eased through the East, spreading scattered showers from Texas to the Atlantic Coast. Widespread snow fell behind the front over the Great Plains, the Midwest, and western New England, with up to a half foot blanketing the Black Hills and Ozarks. In addition, lake-effect snow squalls buried portions of the Great Lakes. Warm and dry conditions persisted in the West, with numerous daily record highs set in California and Washington. Light rain, however, began to fall along the Pacific Coast ahead of an approaching storm system on late Tuesday.

Around mid-week, the Pacific storm system surged into the West, accompanied by heavy precipitation and high winds. Tornadoes, a rare occurrence west of the Rockies, touched down in Santa Ana and Goshen, CA, while heavy snow buried the Sierra Nevadas and the mountains of northern Arizona. Nearly 14 inches of rain was measured at a few isolated locations in southern California, triggering mud slides that closed several highways. Late in the week, intense thunderstorms, accompanied by strong winds, hail, and tornadoes, raked the Southeast in conjunction with an explosively developing storm system. Much of the already-saturated Gulf Coast was again drenched with over 4 inches of rain,

and amounts exceeded 9 inches in parts of the Florida Panhandle (Figure 1). As the week ended, warm, moist air surged northward from the Gulf into the south-central and eastern states while cold Canadian air plunged southward into the northern Plains and upper Mississippi Valley.

According to the River Forecast Centers, the greatest weekly totals (more than 4 inches) were measured in California, central Arizona, and along the Gulf Coast from Louisiana to Georgia and northern Florida (Table 1). Moderate rains (greater than an inch) covered most of the remainder of the Far West, Southwest, and Southeast as well as parts of the central and southern Rockies, western Corn Belt, and Great Lakes. Little or no precipitation fell across much of the northern and central Intermountain West, northern and central Rockies, Great Plains, upper Mississippi and Ohio Valleys, and New England. Alaska and Hawaii were also unusually dry, with only a few locations in southern Alaska receiving more than an inch of precipitation.

Unseasonably warm weather early in the week across the West and Southwest caused weekly temperatures to average more than 3°F above normal, with departures reaching +6°F in portions of the northern Intermountain West. Nearly two dozen stations in the Far West set daily record highs from Sunday to Tuesday. Farther east, unseasonable warmth late in the week over the eastern and south-central states produced weekly departures above +3°F, reaching up to +8°F in the Northeast. Nearly two dozen daily maximum temperature records were broken or tied on Saturday from Texas and Florida northward to Michigan and New England as readings reached into the lower eighties as far north as West Virginia. Readings climbed to 96°F at Brownsville while the nation's first 100°F temperature in 1991 was unofficially observed at Harlingen, TX. Exceptionally mild weather also prevailed across Alaska (Table 2). Temperatures well into the thirties hampered the Iditarod dog sled race.

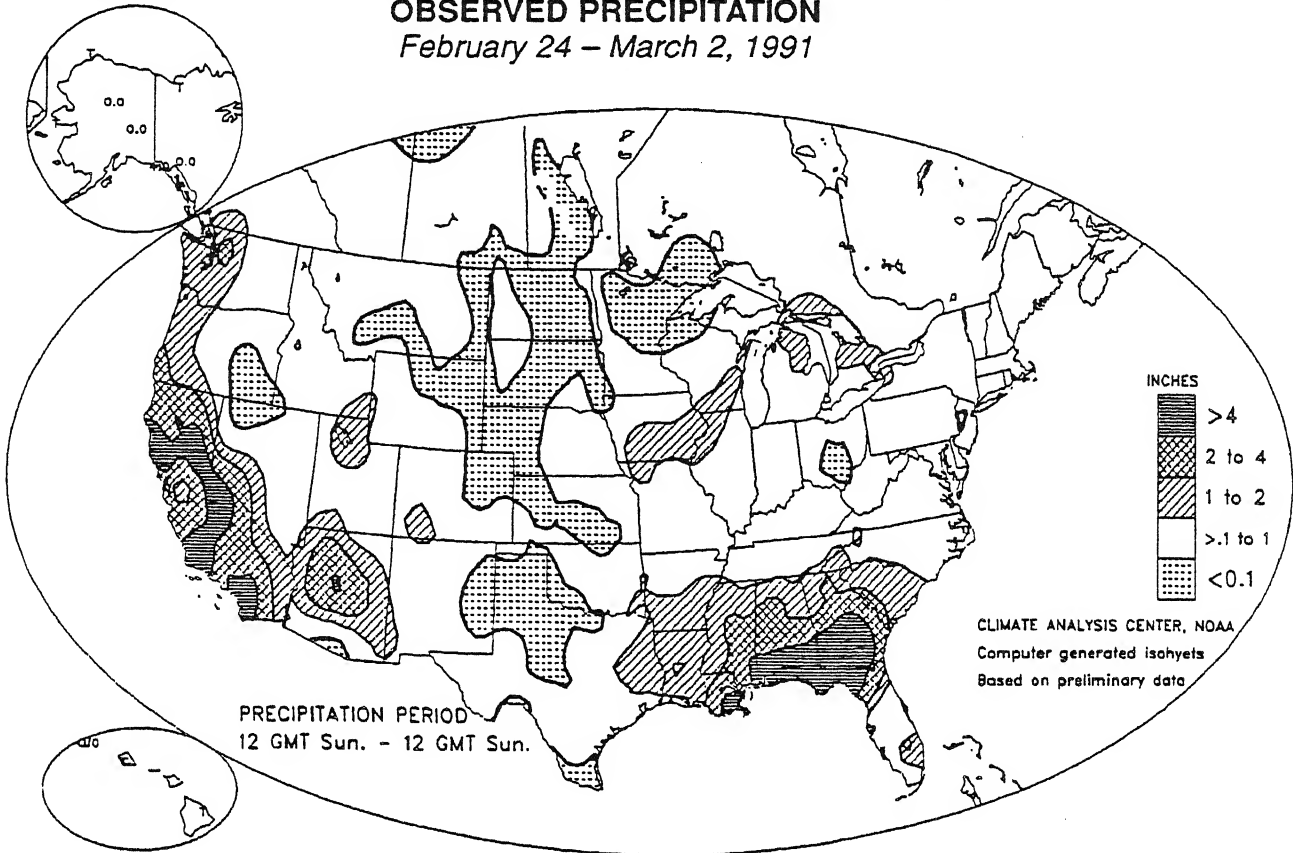
In contrast, Arctic air settled into the northern Rockies, northern Plains, and upper Midwest where temperatures averaged as much as 8°F below normal (Table 3). Brisk northerly winds late in the week produced wind chills of -45°F across eastern North Dakota. Hawaii was also abnormally cool as weekly departures reached -4°F at some locations.

TABLE 1. Selected stations with 3.00 or more inches of precipitation for the week.

TOTAL (INCHES)	STATION	TOTAL (INCHES)
13.39	YAKUTAT, AK	4.03
8.97	PALM SPRINGS, CA	3.91
7.31	NEW ORLEANS/LAKE FRONT, LA	3.78
6.50	SACRAMENTO/MATHER AFB, CA	3.75
6.02	APALACHICOLA, FL	3.66
5.91	WAYCROSS, GA	3.46
5.79	MACON, GA	3.35
5.45	SAN DIEGO/LINDBERGH, CA	3.32
5.29	COLUMBUS/FT BENNING, GA	3.32
4.72	JACKSONVILLE, FL	3.30
4.48	LOS ANGELES, CA	3.25
4.45	MACON/WARNER-ROBINS AFB, GA	3.24
4.42	GAINESVILLE, FL	3.09
4.14	PRESCOTT, AZ	3.03
4.08		

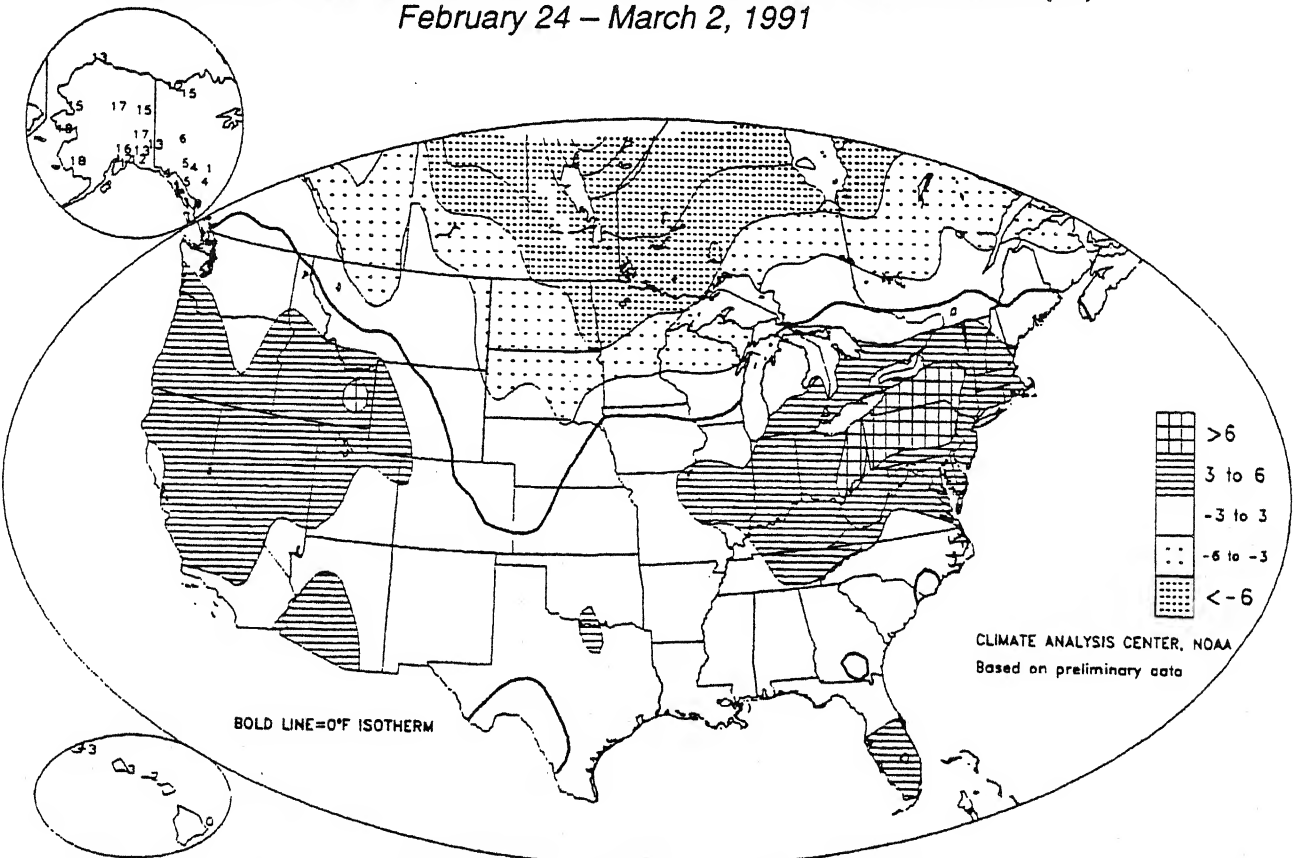
OBSERVED PRECIPITATION

February 24 – March 2, 1991



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

February 24 – March 2, 1991



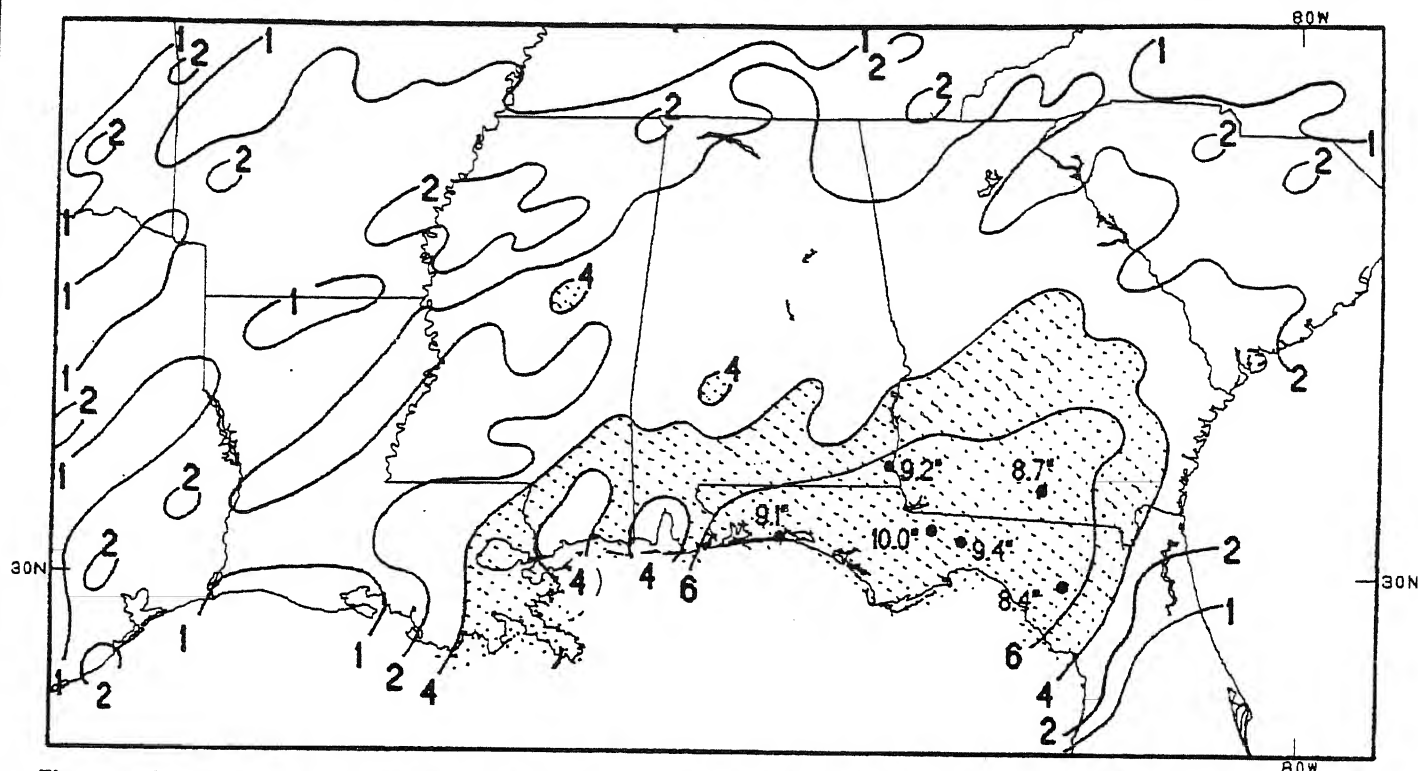


Figure 1. Total precipitation (inches) during the week of February 24 - March 2, 1991 based upon first-order synoptic, airways, and the River Forecast Centers stations. RFC stations actually based upon the period: 12 GMT Sunday (2/24) - 12 GMT Sunday (3/3). Isohyets are only drawn for 1, 2, 4, and 6 inches, and dotted areas are more than 4 inches. After a brief respite (3 weeks), strong thunderstorms dropped copious rains along much of the eastern Gulf Coast, especially on the Florida panhandle, producing localized flooding. Most of the area from the western Gulf Coast eastward to the southern Atlantic Coast has experienced extremely wet weather since late December, which in turn has alleviated long-term precipitation deficits accumulated during the Spring and Summer of 1990. The thunderstorms also generated strong winds, large hail, and over a dozen tornadoes in the area, particularly in Louisiana.

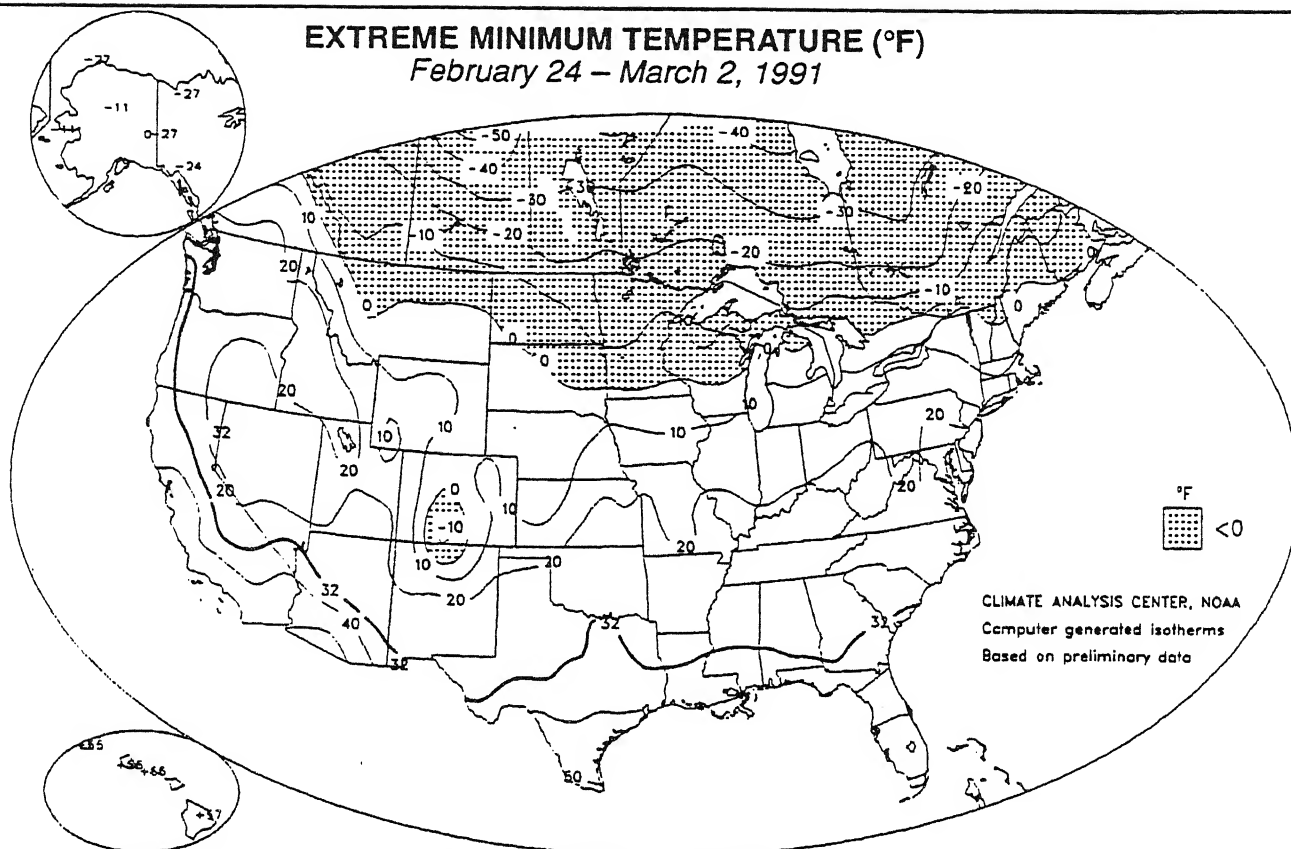
TABLE 2. Selected stations with temperatures averaging 7.0°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
KING SALMON, AK	+22.7	38.6	KENAI, AK	+11.7	29.5
MCGRATH, AK	+21.0	23.1	COLD BAY, AK	+10.3	37.9
NOME, AK	+18.9	22.6	SEXTON SUMMIT, OR	+10.1	47.6
BETHEL, AK	+18.7	26.0	HOMER, AK	+9.6	35.1
ILIAMNA, AK	+18.6	36.3	ERIE, PA	+9.2	37.2
BIG DELTA, AK	+17.2	23.1	IDAHO FALLS, ID	+8.7	36.4
BETTLES, AK	+17.2	14.7	ZANESVILLE, OH	+7.8	41.1
TALKEETNA, AK	+16.9	33.4	SYRACUSE, NY	+7.8	34.9
FAIRBANKS, AK	+16.1	16.9	AKRON, OH	+7.7	38.2
KOTZEBUE, AK	+15.9	11.9	YOUNGSTOWN, OH	+7.6	36.7
GULKANA, AK	+13.7	21.6	BURLINGTON, VT	+7.3	29.4
BARROW, AK	+13.3	-6.4	PITTSBURGH, PA	+7.2	39.6
NORTHWAY, AK	+13.1	10.3	UTICA, NY	+7.1	32.0
VALDEZ, AK	+12.7	36.8	MORGANTOWN, WV	+7.0	42.2
ANCHORAGE, AK	+12.1	32.1			

TABLE 3. Selected stations with temperatures averaging 4.0°F or more BELOW normal for the week.

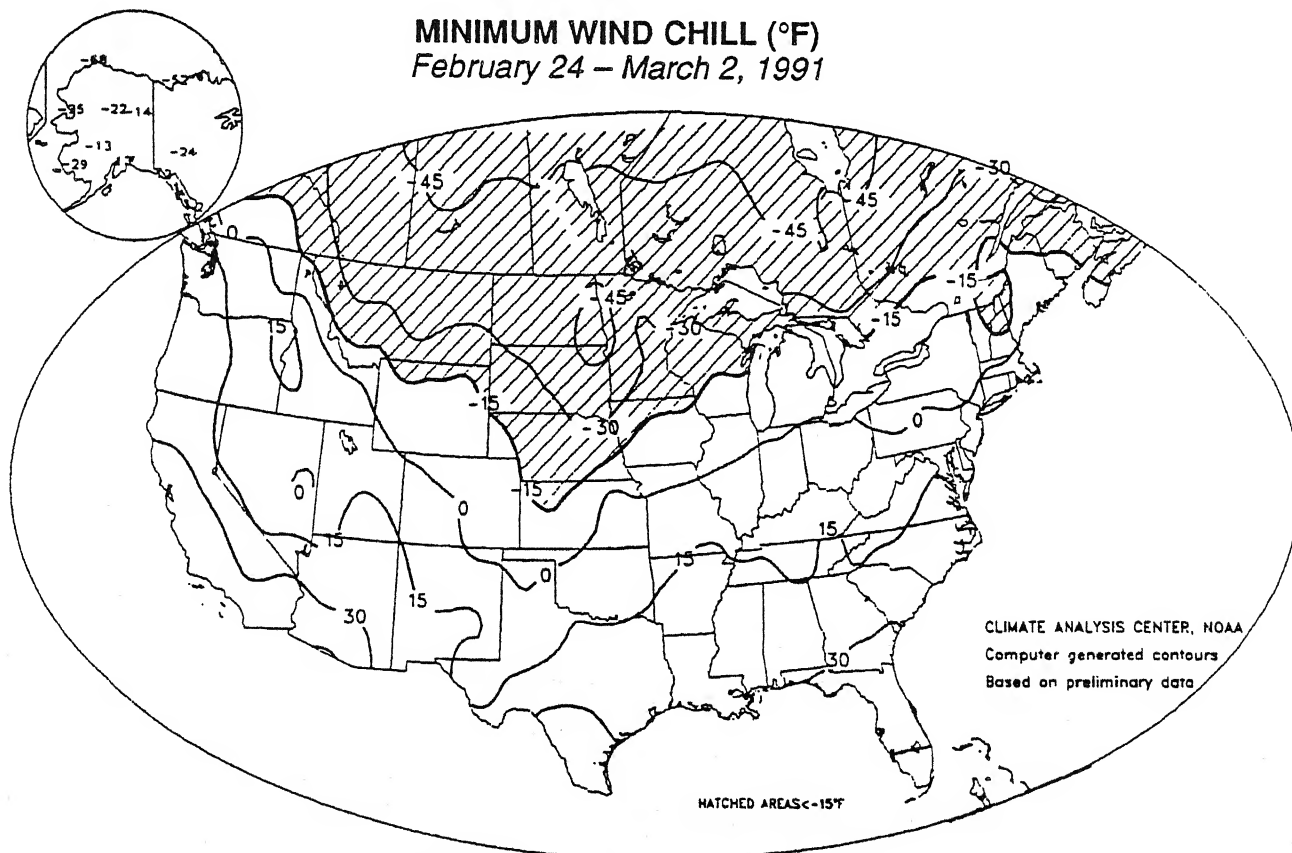
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
FARGO, ND	-8.3	7.9	GREAT FALLS, MT	-5.0	24.4
GRAND FORKS, ND	-7.9	6.4	DICKINSON, ND	-4.9	16.4
WARROAD, MN	-7.7	14.7	ALEXANDRIA, MN	-4.8	12.0
INTERNATIONAL FALLS, MN	-6.4	6.3	PARK FALLS, WI	-4.8	13.9
ESCENABA, MI	-6.0	14.6	WATERTOWN, SD	-4.8	14.6
JAMESTOWN, ND	-5.7	11.5	HELENA, MT	-4.7	24.2
MINOT, ND	-5.7	12.1	MARQUETTE, MI	-4.5	12.8
DULUTH, MN	-5.2	11.5	HANCOCK/HOUGHTON CO, MI	-4.2	12.9
ST. CLOUD, MN	-5.2	13.4	DEVIL'S LAKE, ND	-4.1	8.9

EXTREME MINIMUM TEMPERATURE (°F) *February 24 – March 2, 1991*



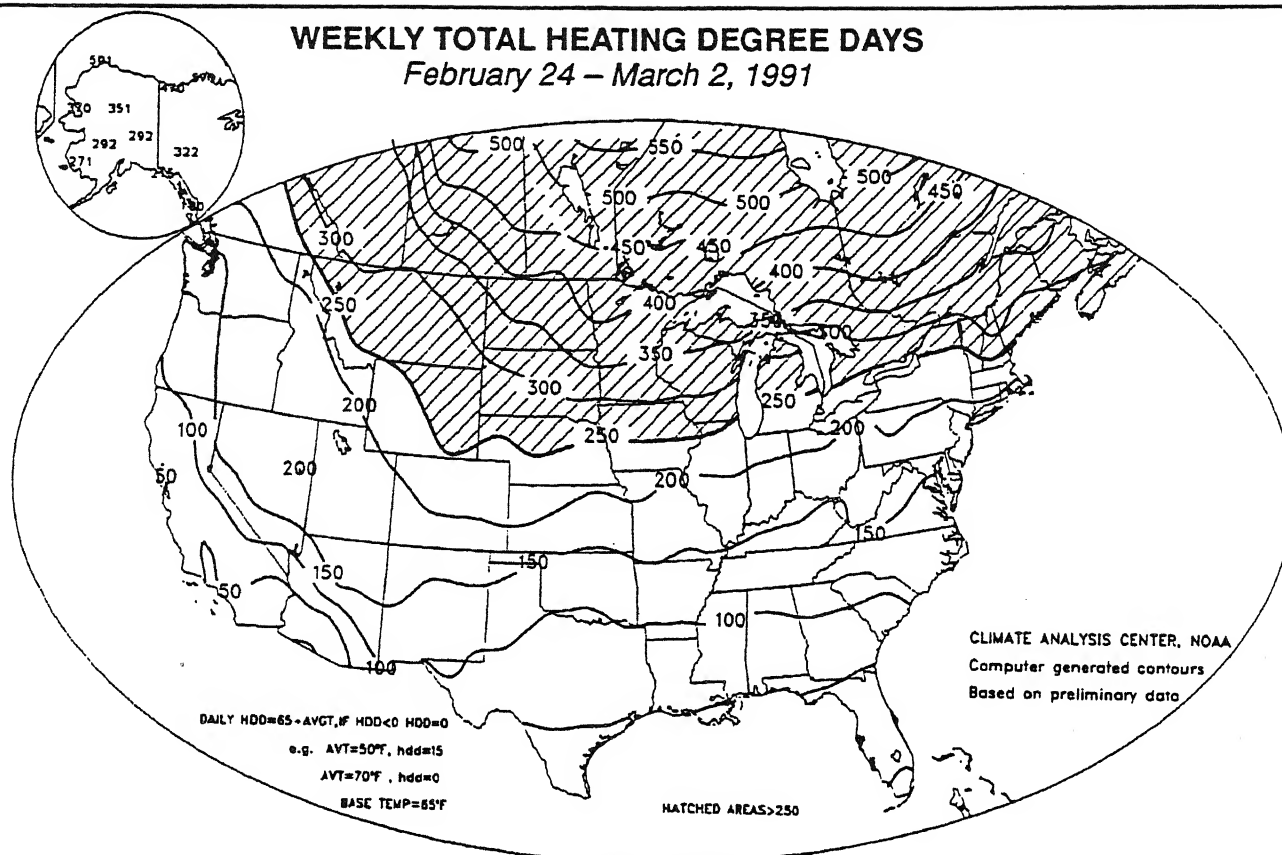
While all but the southern and western tiers of the country fell below freezing, subzero readings were confined to northern portions of New England, the Great Lakes, and the Plains, as well as the highest elevations of the central Rockies (top). Late in the week, gusty northerly winds ushered Arctic air into the northern Plains, bringing bitter wind chills below -30°F to the region (bottom).

MINIMUM WIND CHILL (°F) *February 24 – March 2, 1991*



WEEKLY TOTAL HEATING DEGREE DAYS

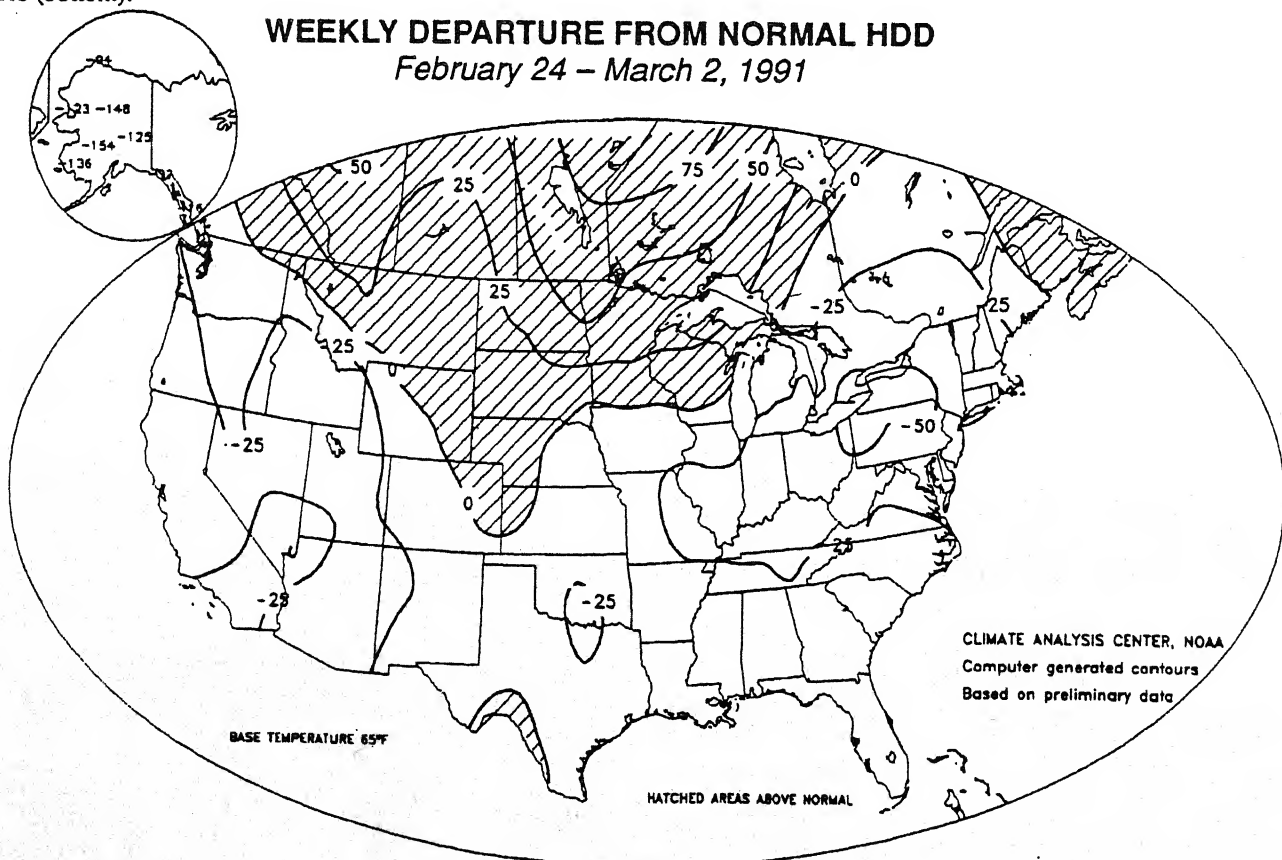
February 24 – March 2, 1991



For the second consecutive week, most of the country experienced milder than normal conditions, with substantial heating usage (>300 HDD's) restricted to northern sections of the Great Plains, Great Lakes, and New England (top). As a result, most of the nation experienced below normal heating demand, with the largest negative departures from normal measured in the lee of Lakes Erie and Ontario (bottom).

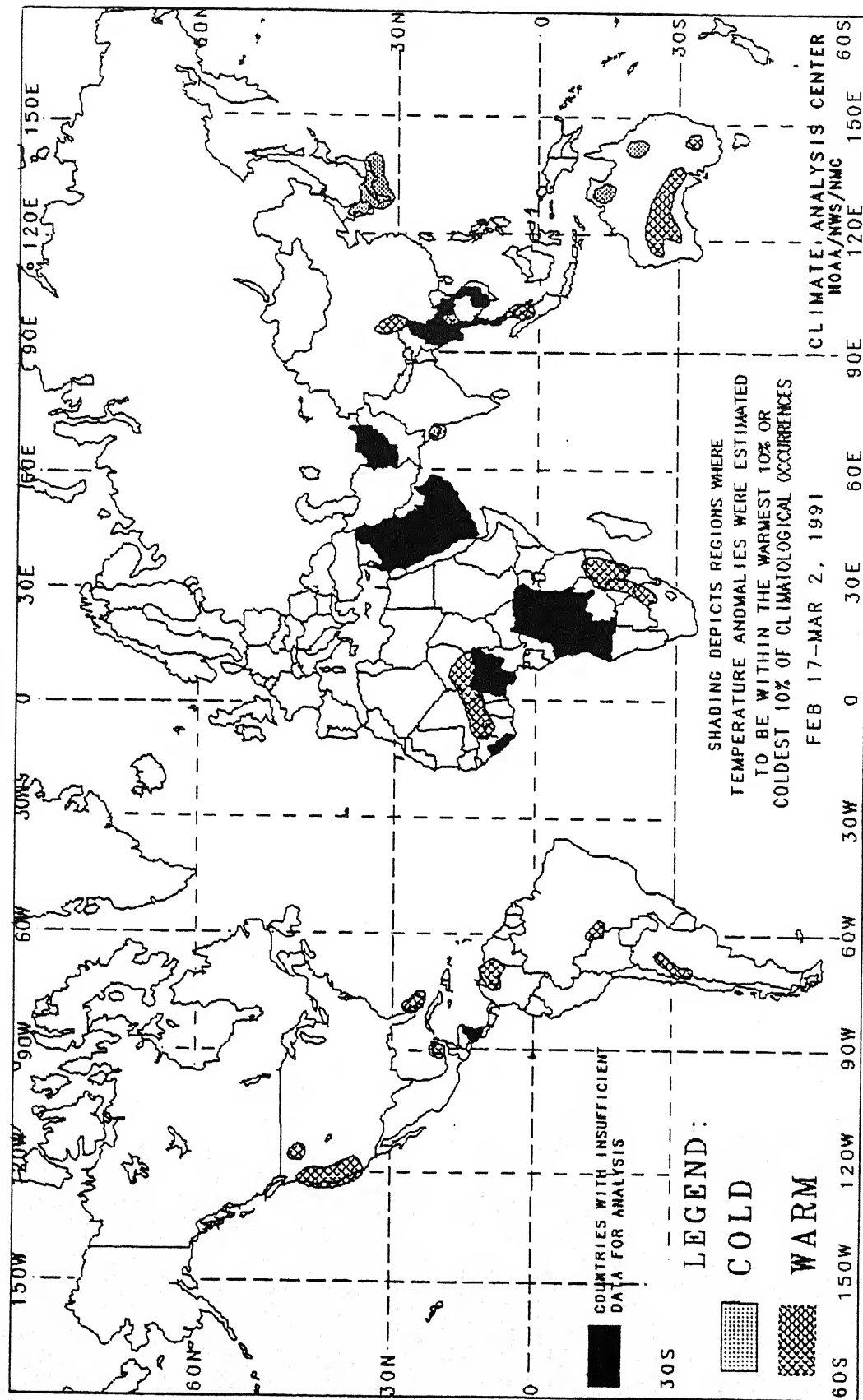
WEEKLY DEPARTURE FROM NORMAL HDD

February 24 – March 2, 1991



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

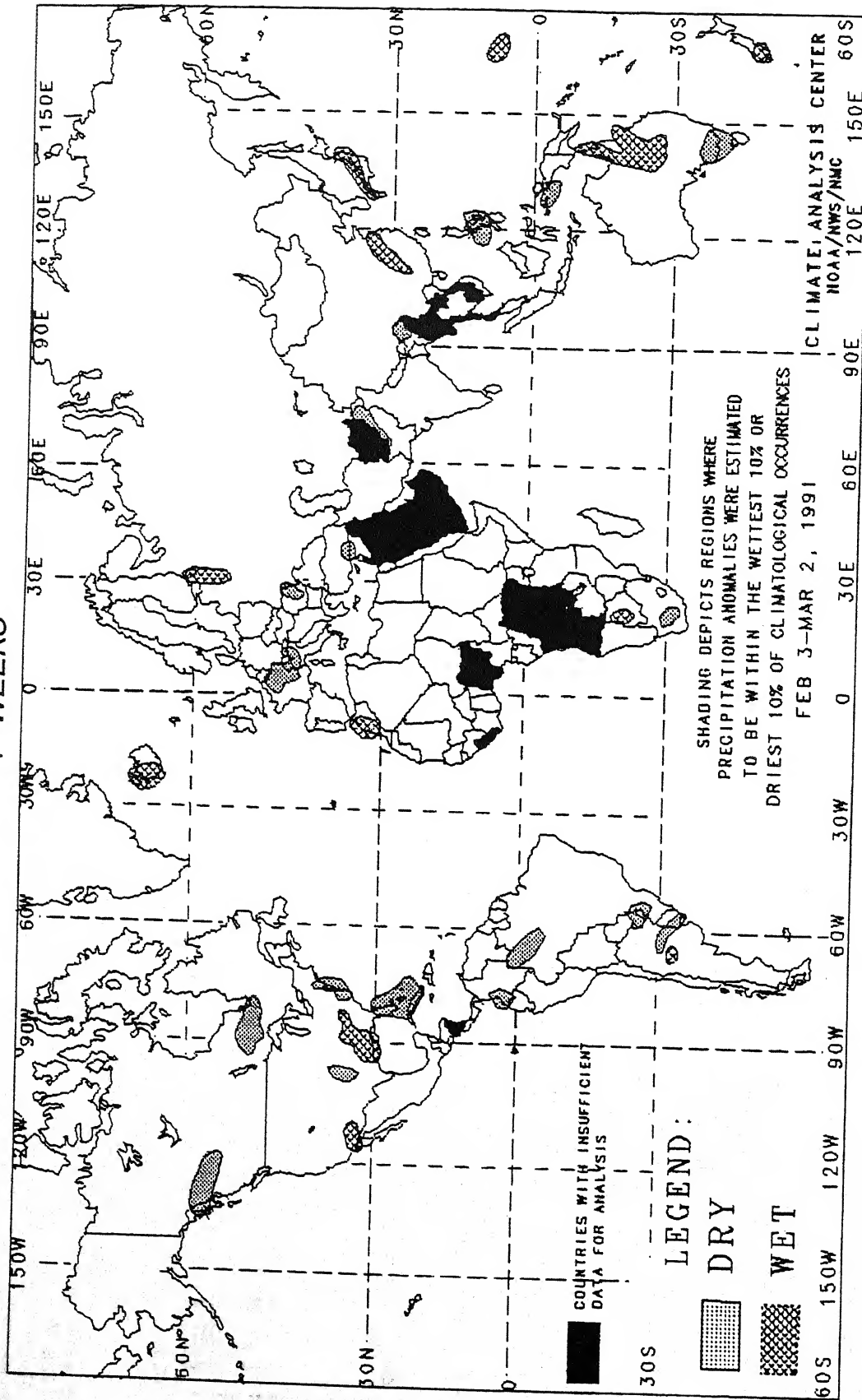
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

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The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.